

DESCRIPTION OF THE *LIMNEPHILUS GRANTI* (NIMMO) FEMALE WITH
A REDESCRIPTION OF THE MALE (TRICHOPTERA: LIMNEPHILIDAE)

DAVID E. RUITER

6260 South Grant Street, Centennial, CO 80121, U.S.A. (e-mail: druiter@msn.com)

Abstract.—Description of the female and redescription of the male of *Limnephilus granti* (Nimmo 1991) are provided. Additional Arizona collection localities are presented.

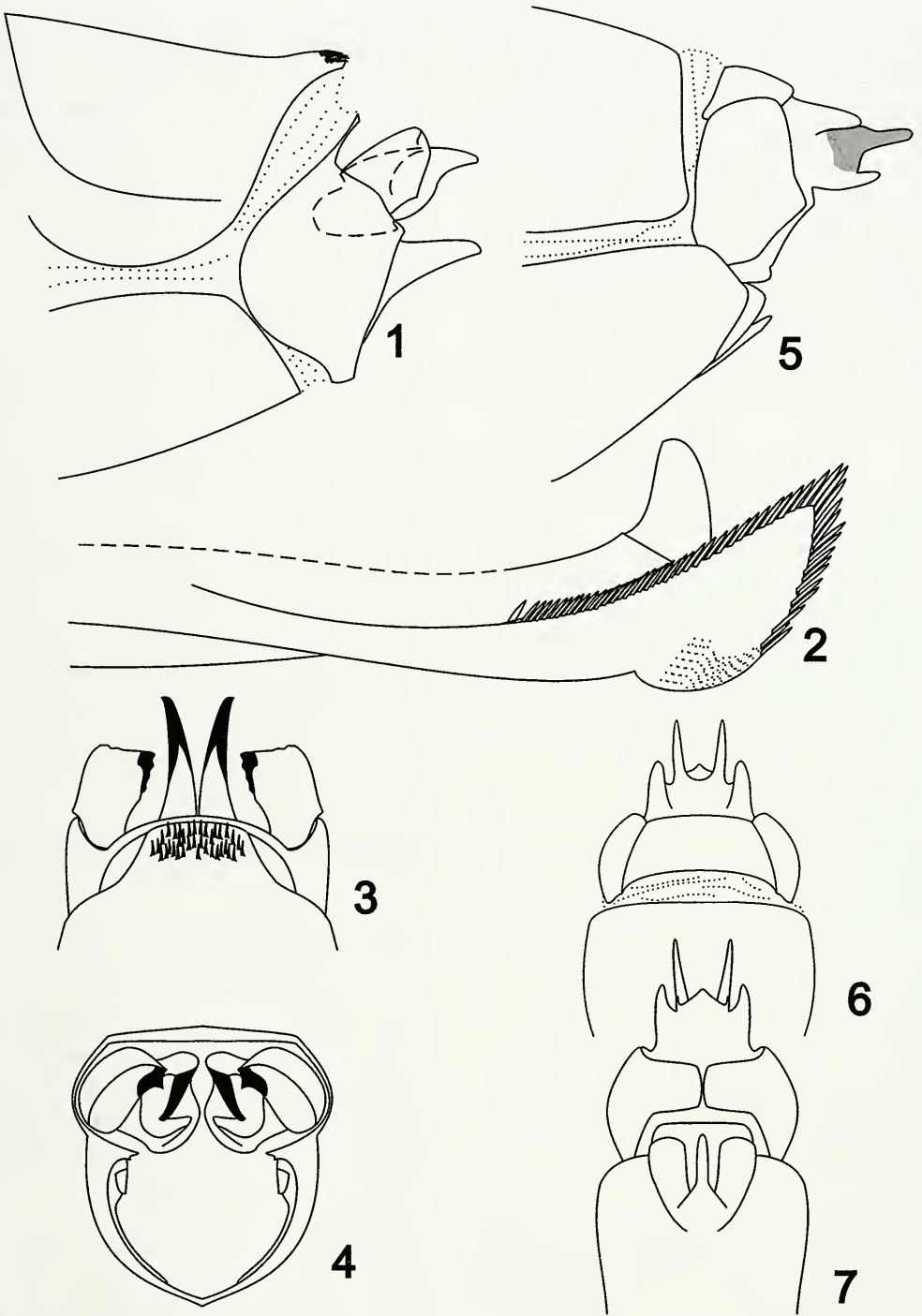
Key Words: Trichoptera, Limnephilidae, *Limnephilus granti*, Arizona, caddisfly

Limnephilus granti (Nimmo 1991) was described from a single male (AZ: Graham County, Grant Creek, Hospital Flat Campground, Graham Mountains). Nimmo (1991) indicated similarity with Schmid's (1955) *L. assimilis* group, in particular *L. parvulus* (Banks) while Ruiter (1995) indicated a questionable affinity with *L. rohweri* (Banks). Discovery of the female does not support either conclusion although the reduced spur count is found in some members of Schmid's *L. assimilis* group. The *L. granti* spur count is reduced from 1-3-4 in both sexes. The female can be distinguished from other *Limnephilus* by the combination of low spur count; completely sclerotized subgenital plate; 9th segment with distinct tergite and distinct ventromesal separation; and tubular 10th segment. The reduced spur count of *L. granti* leads to couplet 10 (*L. solidus* (Hagen) and *L. hamifer* Flint) in Ruiter (1995). The laterally and ventrally divided 9th segment also support this association. However, numerous characteristics of the female 9th tergite and 10th segment, and the male 9th tergal strap and aedeagal parameres, do not support a close relationship with either *L. solidus*

or *L. hamifer*. Therefore, *L. granti* should still be considered *incertae sedis*. *Limnephilus granti* is apparently extremely rare and all specimens have been collected from springs and their immediate outlets in the ponderosa pine region of eastern Arizona. Additional efforts to preserve these rare habitat types and survey their aquatic communities should continue. The following description is based on one male and three females.

Limnephilus granti (Nimmo 1991)
(Figs. 1–7)

Adult.—Head yellow orange with dark brown blotches surrounding ocelli and anterior warts; antenna about 0.7 length of forewing, between 60 and 70 segments, scape about 4 times length of 2nd segment, 3rd segment about twice length of 2nd segment, 4th segment about 1.5 length of 2nd segment, remaining segments subequal to mid-antenna then gradually decreasing in length to apex; 3 ocelli, lateral ocelli subequal to pre-ocelli wart; lateral ocelli located one ocelli width closer to eye than medial suture, located mid-length of head; eye large, width equal to distance between medial suture and eye; medial suture complete;



Figs. 1-7. *Limnephilus granti*. 1, Male genitalia, lateral aspect. 2, Male aedeagus, lateral aspect. 3, Male genitalia, dorsal aspect. 4, Male genitalia, posterior aspect. 5, Female genitalia, lateral aspect. 6, Female genitalia, dorsal aspect. 7, Female genitalia, ventral aspect.

posterior warts oval, width about 2 times length, with about 12 macrosetae; head surface with numerous small, hairlike setae between and slightly behind lateral ocelli, most setae with small, pale, single, basal warts, single pair of large macrosetae located between and slightly behind lateral ocelli; facial warts consisting of 2 subequal, lateral pairs; mesal wart not obvious, mesal area covered with macrosetae; postocular wart relatively narrow, linear, as long as eye height; maxillary palpus three-segmented in male and five-segmented in female, male proportions = 0.4:1:1, female proportions = 0.3:1:1:0.6:0.8; labial palpus 3-segmented in both sexes, proportions = 0.5:0.7:1, basal 2 segments flattened tear-shaped, oval, flattened mesally; labrum 2 times as long as widest portion, widest portion at basal swelling; anterior genal projection present; temporal suture inconspicuous. Pronotum yellow orange, with single pair dorsomesal warts, separated mesally; lateral pronotal area with several individual macrosetae. Mesonotum yellow orange, with pair of linear setal areas, each comprised of 4–6 macrosetae, distinct warts absent; scutellar setal area dark brown with 3–4 isolated macrosetae arranged linearly on each side.

Legs yellow orange, darkening towards tarsi, spines black, tibial spurs orange. Male forefemur with basal black spicules reaching mid length of femur. Tibia and first four tarsal segments with numerous black spines. Apical tarsal segments with single pair of dark spines on ventral surface. Male and female foretarsal proportions = 1:0.6:0.4:0.3:0.3. Tibial spurs variable in female; 1-2-2 in male, 1-2-2 or 1-2-4 in female; evidence of a 1-2-3 and 1-3-4 spur count usually present with reduced basal pits at point of typical spur attachment.

Wing length 13–14 mm. Forewing five times as long as widest portion; brightly contrasted coloration, base color pale orange; hyaline speckling in radial and

apical cells; larger hyaline stripes in thyridial cell and at base of cell V; setae on veins slightly upright, not particularly strong; setae on wing membrane recumbent, fine, hairlike, same color as underlying membrane, i.e., white on white, orange on orange. Hind wing pale yellow, darker along costal area; setae on veins pale, upright, fine, sparse; setae on membrane pale, recumbent, fine, sparse at base, denser towards apex.

Venation similar in both sexes; distal margins smoothly rounded. Forewing with R1–R2 separate throughout length, narrowed and slightly curved at pterostigma; apical forks I, II, III, and V, all cells sessile; anastomosis staggered, R3-discoidal cell common boundary slightly longer than t1, less than discoidal cell height; discoidal cell about 1.5 length of RS; t1 linear, about twice length t2; t1 and t2 not parallel; t3 long, originating on Cu1, nearly perpendicular to thyridial cell, curved posteriorly; three anal cells, cells A1 and A3 small, A2 about 0.5 length of A1+2+3. Hindwing with enlarged anal area; distal margin at Cu not strongly incised; hooked setae along anterior margin absent; R1–R2 separate throughout length, touching near base, separating towards apex, curved at pterostigma; apical forks I, II, III, and V present, all cells sessile; anastomosis staggered; R3-discoidal cell common boundary equal or shorter than t1, less than discoidal cell height; discoidal cell about twice RS; t1 linear, about equal in length to t2; t1 and t2 not parallel; t3 long, originating on Cu1, strongly oblique to wing length; posterior 3 anal cells with long, hairlike setae.

Abdomen orange, becoming brown dorsally; setae fine, inconspicuous except stronger on male 8th; 5th segment gland, kidney shaped, large, surface of 5th tergite finely reticulate over entire surface; ventral spurs absent.

Male genitalia (Figs. 1–4): Tergite 8 with small posteromesal spinate patch,

spines appressed. Segment 9 with very narrow, tall tergite. Superior appendages roughly quadrate laterally; thick and widely separated mesally. Intermediate appendages longer than superior appendages, narrowed apically to slightly downturned apex. Inferior appendages broadly separated ventromesally; directed caudad with nearly acute apex, extending caudally as far as intermediate appendages. Parameres extending beyond endophallus; apical 1/4 expanded with marginal fringe of strong setae.

Female genitalia (Figs. 5–7): Median lobe of subgenital plate subequal to lateral lobes; narrowest at apex; apex narrow, nearly acute. Lateral lobes of subgenital plate roughly parallel; separated laterally from 8th segment. Subgenital plate broad. Ventral lateral lobes of ninth large, quadrate, distinctly separated from tergum, nearly fused mesally. Ninth tergum broad dorsally; ventrolaterally slightly separated from 10th. Tenth segment strongly sclerotized, comprised of a complete cylinder; dorsal lateral appendages separated from 10th; apex of 10th with bladelike dorsal lateral lobes, dorsomesal margin concave, ventromesal margin, acutely convex. Spermatheca with spermathecal vestibule globular, smoothly merged with spermathecal body, with constriction at confluence of vestibule with body; chitinous spermathecal ring tapered, cap-like; no constriction below chitinous ring; additional spermathecal gland located about one width of spermathecal vestibule from spermathecal vestibule; entire inner surface

of spermatheca with minute spicules, without obvious addition markings.

Material examined.—ARIZONA: Apache County, Government Spring, about 2 miles south of Greer, along West Fork Little Colorado River, Dean W. Blinn, 8 June 2003, 2♀; same, 9 June 2003, 1♂; light trap, Rosey Creek at Highway 373, near Greer, Dean W. Blinn, 2 July 2003, 1♀. Rosey Creek female designated allotype and deposited at California Academy of Sciences, San Francisco, CA, with holotype. Remainder of material placed in author's collection.

ACKNOWLEDGMENTS

I thank Dean W. Blinn for his continued search for, and collecting at, these small isolated habitats and providing the material on which this paper is based. The Ohio Biological Survey kindly provided permission for reuse of the male figures. I also thank three reviewers for comments which improved this paper.

LITERATURE CITED

- Nimmo, A. P. 1991. Seven new species of *Limnephilus* from western North America with description of female of *L. pallens* (Banks) (Trichoptera: Limnephilidae, Limnephilinae, Limnephilini). Proceedings of the Entomological Society of Washington 93(2): 499–508.
- Ruiter, D. E. 1995. The adult *Limnephilus* Leach (Trichoptera: Limnephilidae) of the New World. Ohio Biological Survey Bulletin, New Series 11(1): iv + 200 pp.
- Schmid, F. 1955. Contribution à l'étude des Limnophilidae (Trichoptera). Mitteilungen der Schweizerischen Entomologischen Gesellschaft 28: 1–245.